Introduction

Sumter is the county seat of Sumter County, approximately 15 miles west of Interstate 95 and 18 miles south of Interstate 20. Established by settlers in the 1740s, the city has grown into the largest city in the county, and the seventh largest metropolitan area in South Carolina. Within Sumter County, the City of Sumter and Shaw Air Force Base are the primary employment centers and attract numerous peak hour trips each day. The majority of significant commercial development in the county is located along primary transportation corridors such as US 378, US 521, and Broad Street. In the future, planned development will result in increased traffic volumes, similar to that currently generated by major employers and commercial developments in the area.

As commercial development continues and population increases, traffic volumes can be expected to climb. This increase in traffic volumes will create new deficiencies on the existing transportation network. Traffic bottlenecks may become evident in places that currently function adequately and existing deficiencies will be magnified.

Evaluating the existing transportation system helps to better identify needs and priorities for the purposes of planning. The discussion of existing highway conditions is organized into the following sections:

- Transportation Corridors and Activity Corridors
- Functional Classification
- Corridor Operations
- Traffic Safety and Crash History

Transportation Corridors and Activity Centers

An inherent relationship exists between land use and transportation. As development occurs and more vehicles take to the road, roadway improvements are needed to reduce traffic congestion. These roadway improvements often enhance access, thus raising land values and attracting more development. The figure to the right illustrates this continuing cycle of influence between land use and transportation.

The interaction between activity centers and the transportation corridors that link them to other centers and destinations is important, as is the mobility choices that are provided within the center. Often neighborhoods and activity centers rely on a small number of transportation corridors to provide essential links between home, school, employment, shopping, social, and recreation destinations. The extent to which these origins and destinations blend into multi-purpose activity centers has a dramatic effect on a person's ability to choose between modes for their trip. In many cases, the range of trip alternatives (walk, bike drive, or transit) also can influence the overall perception of a community. **Table 4.1** on the following page summarizes three types of activity centers – regional, community, and neighborhood – and provides local examples.

The level of success for corridors within and between activity centers depends in large part on the intended function of the street. A unique challenge for the future will be to balance the area's mobility needs with other priorities. Often traffic mobility has been given priority without regard for other considerations such as the function of the street, corridor relationship to land use, urban design, and the promotion of alternate modes.

One of the unique challenges in creating a successful transportation system for the SUATS region is blending connectivity and access functions with preservation of natural features and the unique character of the SUATS MPO area. Neighborhoods and smaller communities within the region may have different needs and priorities. While recognizing these differences, it is important not to lose focus of the practical concept of overall connectivity. This concept is particularly relevant as it relates to people's desires to make safe and efficient trips not only by driving, but also by walking, bicycling, or using public transportation. The discussion of complete streets in **Chapter 5** sets the stage for the region to balance the mobility and access functions of a roadway.

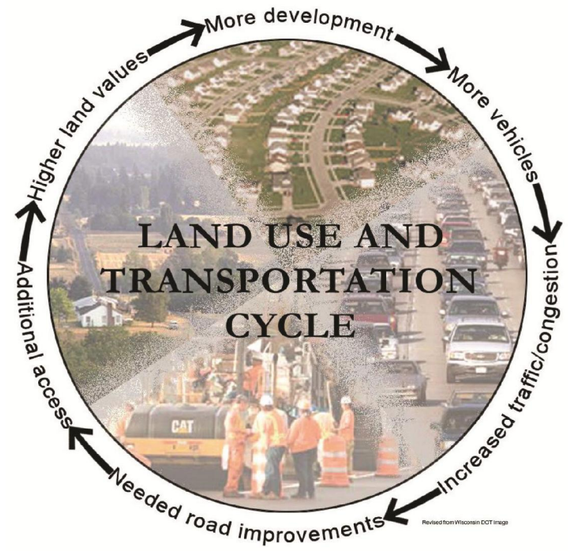
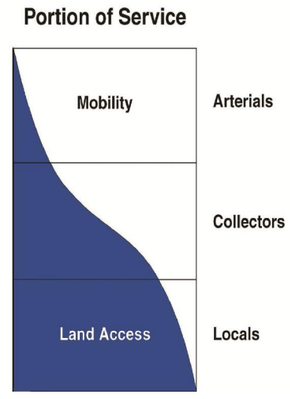


Table 4.1 – Activity Centers

Center Type	Characteristics
Regional Activity Center Local Example ▪ Downtown Central Business District Transportation Corridor ▪ Main Street	▪ Large-scale, transit supportive center of employee-intensive land uses ▪ Core areas contain large-scale and high intensity urban land uses supported by and serving communities within the region ▪ Accessed by interstates/freeways, major arterials, and public transportation ▪ Served by municipal water and sewer ▪ Higher residential densities ▪ Balance between residential/non-residential land use
Community Activity Center Local Example ▪ Sumter Mall Transportation Corridor ▪ Broad Street	▪ Include a combination of retail, personal services, civic, educational, and social uses ▪ Core areas contain medium-scale development that serve the day-to-day needs and activities of the core area occupants and the surrounding neighborhoods ▪ Accessed by major arterials and public transportation ▪ Served by municipal water and sewer ▪ Medium density residential areas ▪ Residential/non-residential land use mix is approximately 60/40
Neighborhood Activity Center Local Example ▪ Wilson Hall Neighborhood Transportation Corridor ▪ South Wise Drive	▪ Mostly residential with a mixed-use core that serves as a focal point for the neighborhood and provides retail and service needs ▪ Accessed by major and minor arterials with integrated collector street access ▪ Mixture of low and medium density residential areas ▪ Transit service provided or desired

Functional Classification

The classification of streets into several "functional" categories aids in communication among policy makers, planners, engineers, and citizens for expanding the transportation system. The functional classification system groups streets according to the land use served (or to be served) and provides a general designation of the type of traffic each street is intended to serve. The functional classification system primarily defines the street in terms of roadway design and character, as well as operational features for the movement of vehicles.



Two major considerations for classifying arterials from neighborhood streets are access and mobility. The primary function of local or neighborhood streets is to provide access. These streets are intended to serve localized areas or neighborhoods, including local commercial and mix-use land uses (i.e. low speeds, low volumes, short distances). Local streets are not intended for use by through traffic. The primary function of arterials is mobility. Limiting access points (intersections and driveways) on arterials enhances mobility. Too much mobility at high speeds limits access by pedestrians and bicyclists. The arterial is designed with the intent to carry more traffic than is generated within its corridor (i.e. higher speeds, higher volumes, and longer distances).

Classifying the SUATS MPO area street system required close examination of roles that each street performs in the overall transportation system. Sumter City-County Planning Department worked with SCDOT in 2012 to update the MPO's functional classification network. As a result of this exercise, the existing public street network in Sumter is divided into several functional classifications, including arterials, collectors, and locals. **Figure 4.1** illustrates the functional classifications for Sumter's roadway network.

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Figure 4.1
Functional Classification

- Freeway / Expressway
- Major Arterial
- Minor Arterial
- Collector
- Street
- Dirt Road
- Railroad
- Shaw Air Force Base
- City Limits
- Study Area Boundary
- County Boundary

NORTH
0 0.5 1 2 Miles

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Arterials

Arterials provide high mobility, operate at higher speeds (45 mph and above), provide significant roadway capacity, have a greater degree of access control, and serve longer distance travel. Arterials can be subdivided into categories that include facilities with full access control such as freeways and expressways, as well as major and minor arterials. Arterials usually connect to one another or to collector streets. Very few arterials connect to local streets.

Expressways and Freeways

Expressways and freeways provide the most mobility and least access (since access is only available at interchanges). Freeway/expressway facilities typically serve longer distance travel and support regional mobility. The state funds roadway improvement and maintenance on these facilities. The US 76-378 Bypass (Robert Graham Freeway) is classified as an expressway/freeway.

Expressway/Freeway – US 76-378

Major Arterial – Broad Street

Major Arterials

Major arterials typically have tightly controlled access and few, if any, individual site driveways. These facilities serve medium to longer distance travel and typically connect minor arterials and collector streets to freeways and other higher type roadway facilities. Generally, roadway improvements and maintenance on major arterials are funded by the state.

Major arterials within the SUATS area include Broad Street (US 76 Business), US 15, US 521, SC 441, US 76 west of the US 76-378 Bypass, and US 401 north of the US 76-378 Bypass.

Minor Arterials

Minor arterials primarily serve a mobility function but often have more closely spaced intersections, some individual site driveways, and generally lower design and posted speeds compared to other arterials. The minor arterial network is primarily intended to serve travel demand within the local area. These roadways connect to other minor arterials, to major arterials, and to collector streets. Minor arterials provide a higher level of access to adjacent land uses than major arterials and typically have lower traffic volumes. For the most part, minor arterials are maintained by the state, but the cost of improvement may be the responsibility of local governments.

In general, minor arterials in Sumter have two-lane undivided cross-sections with little or no paved shoulders and an occasional left-turn lane at intersections and major driveways. Posted speed limits on minor arterials range from 35 mph to 45 mph. other characteristics may include sidewalks, signalized intersections, and on-street parking (in residential areas and the centralized business district).

Minor arterials in Sumter include Alice Drive, Patriot Parkway, Pinewood Road, North Main Street, Wedgefield Road, and Loring Mill Drive.

Collectors

Collectors typically provide less overall mobility, operate at lower speeds (less than 35 mph), have more frequent and greater access flexibility with adjacent land uses, and serve shorter distance travel than arterials. Collectors provide critical connections in the roadway network by bridging the gap between arterials and locals. Thus, the majority of collector streets connect with one another, with local streets, and with non-freeway/expressway arterials.

Minor Arterial – Alice Drive

Collector – Loring Place

The primary purpose of the collector street system is to collect traffic from neighborhoods and distribute it to the system of major and minor arterials throughout an area. In general, collector streets have two lanes and often have exclusive left-turn lanes at intersections with major and minor arterials and less frequently at intersections with other collector streets. Collector streets are rarely constructed and funded by the state. Responsibility for collector streets usually falls to the local government and the development community for funding, design, and construction.

Within Sumter, collector streets have a wide range of physical characteristics, some of which are attributable to the neighborhoods in which they exist. Though different, the one commonality is that of providing good connectivity.

Examples of collector streets in the SUATS area include Carter Road, East Calhoun Street extended, Kingbury Drive, Lewis Road, South Main Street, and Stadium Road.

Locals

Local facilities provide greater access and the least amount of mobility. These facilities typically connect to one another or to collector streets and provide a high level of access to adjacent land uses/development (i.e. frequent driveways). Locals serve short distance travel and have low posted speeds limits (25 mph to 35 mph). Most roadways within the SUATS area are classified as locals.

Local Road

Corridor Operations

Regional Access

Regional access in the SUATS area is provided by three major US routes: US 15, US 521, and US 378. While US 15 and US 521 are not freeways today, these corridors connect to the region's freeways (including US 378) and provide for the relatively efficient movement of high volumes of traffic and increased mobility (except during peak traffic periods).

The primary north-south route is US 15, which connects Sumter to I-20 to the north and I-95 to the south. US 521 provides an alternate connection to I-95 and points south. Movements east and west rely on the network of roads near downtown as well as the US 76-378 Bypass (Robert Graham Freeway). US 76-378 connects Sumter with Columbia to the west. To the east, US 378 connects Sumter to I-95 before continuing to Conway and Myrtle Beach.

Congested Corridors

Congestion in corridors is related to a number of factors, but is often the result of bottlenecks – primarily at intersections – along the corridor. Aside from individual bottleneck locations in corridors, congestion frequently results from too many people trying to use a route that is already at or over-capacity.

Traffic volumes signify the total number of vehicles traveling along a roadway segment on an average day. **Figure 4.2** illustrates existing congested corridors in the SUATS MPO area, determined using the SCDOT's regional travel demand model. The region's highest traffic volume of 30,800 vehicles per day occurs on Broad Street south of the US 76-378 Bypass (Robert Graham Freeway). US 76-378 (Broad Street) experiences high traffic volumes (20,200 vehicles per day) between Loring Mill Road and the US 76-378 Bypass (Robert Graham Freeway). Minor arterials with high traffic volumes include Alice Drive near Wise Drive (11,900 to 15,200 vehicles per day). Compared to freeways/expressways and arterials, the volumes on collectors and locals are lower due to their design and location.

However, traffic volumes alone should not be used to determine congested corridors because this measurement does not take into account different functional classifications and roadway capacity. A better measurement for this comparison is volume-to-capacity (V/C) ratios. V/C ratios are calculated by dividing the traffic volume of a roadway segment by the theoretical capacity of the roadway. Although V/C can be tied to level of service (LOS), V/C allows for a more specific analysis. The result is a universal quantitative measurement. The V/C ratios shown in **Figure 4.2** fall into one of the following categories:

- *Approaching Capacity* (V/C = 0.9 to 1.09) – A roadway with a V/C less than 0.8 typically operates with efficiency. As the V/C nears 1.0, the roadway becomes more congested. A roadway approaching capacity may operate effectively during non-peak hours but be congested during peak travel periods.
- *At Capacity* (V/C = 1.10 to 1.29) – Roadways operating at capacity or slightly above capacity are heavily congested during peak periods and moderately congested during non-peak periods. A change in capacity due to incidents greatly impacts the travel flow on corridors operating within this V/C range.
- *Over Capacity* (V/C > 1.30) – The roadways in this category represent the most congested corridors in the SUATS area. These roadways are congested during non-peak hours and most likely operate in stop-and-go gridlock conditions during the morning and evening peak travel periods.

Growth in the SUATS MPO area, along with insufficient increases in roadway capacity, has resulted in peak hour traffic congestion on many major area roadways. During the morning and afternoon peak travel periods, sections of commuter travel corridors are frequently congested.

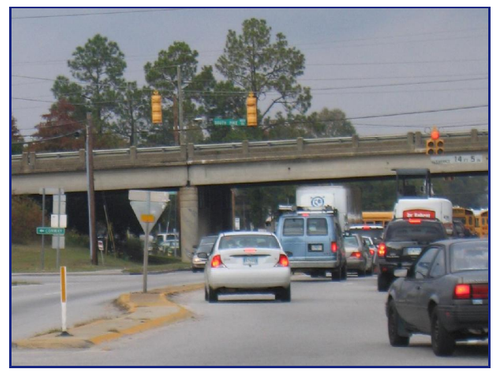
The most notable congestion occurs on Alice Drive, an important minor arterial that connects US 521, US 76-378 Bypass, and West Liberty Street west of downtown. Much of this corridor operates over capacity with V/C ratios ranging from 1.05 south of Wesmark Boulevard to 0.98 just before Alice Drive's terminus at West Liberty Street. The V/C ratio of North Guignard Drive ranges from 0.87 at Wise Drive to 1.01 near Gion Street. Other congested corridors include:

- Camden Highway from US 521 to Brewington Road
- Patriot Parkway near Loring Mill Road
- Loring Mill Road from Wise Drive to Wedgefield Road

The Transportation Improvement Program (TIP) provides a financially constrained list of the most immediate priority transportation improvements for an area. The current (2013-2018) TIP projects of interest in the SUATS MPO area include the widening of Alice Drive in three phases as well as the spot safety intersection improvements. Phases I and II of Alice Drive are complete, and Phase III is currently underway. The recommendations that follow in **Chapter 5** as well as the multimodal solutions presented in **Chapters 6-8** aim to alleviate system-wide congestion in a cost-effective and time-efficient manner.

Level of Service A

Level of Service B



Level of Service E or F

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Figure 4.2
Existing Congested Corridors

Volume to Capacity Ratio

- 0.90 - 1.09
- 1.10 - 1.29
- Greater than 1.30
- Street
- Dirt Road
- Railroad
- Shaw Air Force Base
- City Limits
- SUATS Study Area Boundary
- County Boundary

NORTH
0 0.5 1 2 Miles

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Traffic Safety and Crash History

Traffic safety is a key component to any successful transportation plan, and a thorough examination of crash history and traffic patterns can usually predict key locations where an improvement in traffic safety will be beneficial to both motorists and the community as a whole. A traditional approach to determining locations for safety countermeasures involves studying the number and type of crashes in a location, as well as the associated crash rate for the location.

The methodology used in this analysis builds on that traditional approach, while factoring in other key components such as total volume of vehicles entering the intersection per day, equivalent property damage only rate, inclusion in the state transportation improvement program, and functional classification of the intersecting roadways. The inclusion of these components allows the user to establish a priority ranking system that will allow money earmarked for safety projects to be spent in the most efficient and cost-effective manner.

The worst-case crash locations considered for safety improvement in the SUATS study area are shown in **Table 4.2**. The summary of crash data shown in the table represents reported crashes at the specified locations from January 2008 through December 2010. These locations also are identified in **Figure 4.3**. Each location was analyzed and given a weighted score for influential factors. The sum of these weighted scores was used to determine the overall safety ranking of the intersection.

Contributing factors to a location's high crash frequency include intersection design, access considerations, and traffic congestion. Many of the locations identified with high crash frequency were also locations where congestion often exists. A direct relationship exists between traffic congestion and crash frequency, which justifies the ongoing efforts to provide adequate funding for transportation projects that minimize traffic congestion. Driveway access in proximity to intersections can also contribute to crash frequency by increasing the unexpected conflict points near the intersection.

The following sections provide a more detailed analysis of the top ten priority locations concerning crashes, as well as recommendations for potential countermeasures based on the priority ranking system and a detailed engineering field review.

Priority Locations

A preliminary review of the crash history was performed for the top ten intersections based on the priority ranking system. South Carolina Department of Transportation provided detailed intersection crash data, including causational factors, overall severity, and top crash types for all of the analyzed intersections. Field investigations were performed to confirm existing conditions, identify design features, and observe driver behavior. Field observations provided insight to potential patterns and revealed conditions that could be enhanced through geometric changes or enhancements to traffic control.

Table 4.2 and **Figure 4.3** show the top ten worst-case crash locations in the SUATS study area as rated by SCDOT. Two of those intersections have already been identified by SCDOT as locations for future improvements. In addition, **Table 4.3** lists five intersections currently under improvement (design/construction) as a part of the Penny Sales Tax program. These five intersections were identified as top safety issues in the 2035 LRTP. Due to their inclusion in this program, these intersections were not evaluated in the intersection safety priority rankings. The following section provides more details on the intersections featured in **Table 4.2**. For each location a list of crash statistics, potential causational factors, and recommended countermeasures are included.

Table 4.3 Sales Tax Safety Intersections

#	Street 1	Street 2
1	Patriot Parkway	Broad Street
2	Carter Road	Broad Street
3	Gion Street	Broad Street
4	Lafayette Drive	Liberty Street
5	Pocalla Road	Lafayette Drive
6	US 76-378 Bypass	Lafayette Drive/Main St.

Table 4.2 Intersection Priority Rankings

#	Street 1	Street 2	Crashes 2008-2010				Vehicles Entering	MEV Crash Rate
			Total	PDO	Injury	Fatality		
1	US 76 (Broad St)	S-1074 (Wesmark Blvd)	25	22	3	0	40000	0.57
2	US 76 (Broad St)	US 521 (Bultman Dr)	34	18	16	0	43000	0.72
3	SC 120 (Pinewood Rd)	S-33 (McCrays Mill Rd)	22	14	8	0	32600	0.62
4	US 15	S-25 (Lewis Rd / Old Manning Rd)	25	12	13	0	26300	0.87
5	US 15 (Guignard Dr)	SC 763 (Liberty St)	32	24	8	0	31000	0.94
6	SC 763 (Liberty St)	SC 120 (Alice Dr)	21	11	10	0	28800	0.67
7	US 76 (Broad St)	S-55 (Miller Rd)	20	6	14	0	32500	0.56
8*	SC 120 (Pinewood Rd)	S-528 (Kolb Rd)	32	19	13	0	9600	3.04
9	S-25 (Lewis Rd)	S-522 (Kingsbury Dr)	26	22	4	0	10700	2.22
10*	SC 763 (Wedgefield Rd)	S-507 (Pitts Rd)	23	13	10	0	8400	2.50

*SCDOT Safety Projects

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Figure 4.3
Crash Locations

- High Crash Intersection
- Sales Tax Safety Intersection
- Street
- Dirt Road
- Railroad
- Shaw Air Force Base
- City Limits
- SUATS Study Area Boundary
- County Boundary

NORTH
0 0.5 1 2 Miles

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Priority Intersection Analysis

1. US 76 (Broad Street) and S-1074 (Wesmark Boulevard)

The intersection of US 76 and S-1074 experienced 25 total crashes over the 3-year analysis period. Of these 25 crashes, none were fatal and 3 involved at least one injury. The top contributing circumstances for this location include drivers disregarding the signal (11 occurrences) and drivers traveling too fast for the roadway conditions (7 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Consolidate and/or define driveways (i.e. shared use)
- Install back plates on all signal heads
- Extend concrete islands to better delineate turn lanes

2. US 76 (Broad Street) and US 521 (Bultman Drive)

The intersection of US 76 and US 521 experienced 34 total crashes over the 3-year analysis period (2008-2010). Of these 34 crashes, none were fatal and 16 involved at least one injury. The top contributing circumstances for this location include drivers disregarding the signal (12 occurrences) and improper lane usage/change or improper turn (8 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Consolidate and/or define driveways (i.e. shared use)
- Install back plates on all signal heads
- Extend concrete islands to better delineate turn lanes

3. SC 120 (Pinewood Road) and S-33 (McCrays Mill Road)

The intersection of SC 120 and S-33 experienced 22 total crashes over the 3-year analysis period. Of these 22 crashes, none were fatal and 8 involved at least one injury. The top contributing circumstances for this location include drivers failing to yield the right-of-way (10 occurrences) and drivers disregarding the signal (4 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Consolidate and/or define driveways (i.e. shared use)
- Install back plates on all signal heads
- Install concrete islands to better delineate turn lanes

4. US 15 and S-25 (Lewis Road / Old Manning Road)

The intersection of US 15 and S-25 experienced 25 total crashes over the 3-year analysis period. Of these 25 crashes, none were fatal and 13 involved at least one injury. The top contributing circumstances for this location include drivers failing to yield the right-of-way (13 occurrences) and drivers disregarding the signal (8 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Consolidate and/or define driveways (i.e. shared use)
- Install back plates on all signal heads

5. US 15 (Guignard Drive) and SC 763 (Liberty Street)

The intersection of US 15 and SC 763 experienced 32 total crashes over the 3-year analysis period. Of these 32 crashes, none were fatal and 8 involved at least one injury. The top contributing circumstances for this location include drivers failing to yield the right-of-way (14 occurrences) and drivers disregarding the signal (6 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Consolidate and/or define driveways (i.e. shared use)
- Install back plates on all signal heads
- Extend concrete islands to better delineate turn lanes

6. SC 763 (Liberty Street) and SC 120 (Alice Drive)

The intersection of SC 763 and SC 120 experienced 21 total crashes over the 3-year analysis period. Of these 21 crashes, none were fatal and 10 involved at least one injury. The top contributing circumstances for this location include drivers failing to yield the right-of-way (10 occurrences) and drivers traveling too fast for the roadway conditions (4 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Consolidate and/or define driveways (i.e. shared use)
- Install pedestrian signal heads on approaches with crosswalks

7. US 76 (Broad Street) and S-55 (Miller Road)

The intersection of US 76 and S-55 experienced 20 total crashes over the 3-year analysis period. Of these 20 crashes, none were fatal and 14 involved at least one injury. The top contributing circumstances for this location include drivers failing to yield the right-of-way (16 occurrences) and drivers disregarding the signal (4 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Install back plates on all signal heads
- Extend concrete islands to better delineate turn lanes

8. SC 120 (Pinewood Road) and S-528 (Kolb Road)

The intersection of SC 120 and S-528 experienced 32 total crashes over the 3-year analysis period. Of these 32 crashes, none were fatal

and 13 involved at least one injury. The top contributing circumstances for this location include drivers failing to yield the right-of-way (18 occurrences) and drivers traveling too fast for the roadway conditions (6 occurrences).

SCDOT has identified this intersection for safety improvements. Specific improvements and countermeasures for this intersection will be determined by SCDOT as a part of their safety improvement program.

9. S-25 (Lewis Road) and S-522 (Kingsbury Drive)

The intersection of S-25 and S-522 experienced 26 total crashes over the 3-year analysis period. Of these 26 crashes, none were fatal and 4 involved at least one injury. The top contributing circumstances for this location include drivers failing to yield the right-of-way (16 occurrences) and drivers traveling too fast for the roadway conditions (4 occurrences).

Based on visual observations and the prevailing crash pattern at the intersection, the following potential countermeasures are recommended at this location:

- Install advanced warning signs on all approaches to the intersection

10. SC 763 (Wedgefield Road) and S-507 (Pitts Road)

The intersection of SC 763 and S-507 experienced 23 total crashes over the 3-year analysis period. Of these 23 crashes, none were fatal and 10 involved at least one injury. The top contributing circumstances for this location include drivers traveling too fast for the roadway conditions (12 occurrences) and drivers failing to yield the right-of-way (6 occurrences).

SCDOT has identified this intersection for safety improvements. Specific improvements and countermeasures for this intersection will be determined by SCDOT as a part of their safety improvement program.

Recommended Countermeasures

The countermeasures outlined in this section were developed based on data analysis and field observations. Further analysis of each location should be undertaken before determining which final countermeasure should be implemented. A detailed study of crash reports for each location will likely yield the most beneficial and cost-effective solution.

Ideally, countermeasures should be implemented based on the established priority rankings provided in **Table 4.2**. It is not uncommon, however, to select particular countermeasures based on their overall cost and timeframe for implementation. It also is not uncommon to address those locations that are most beneficial to the community, in a more public-guided approach. This mix-and-match approach should allow Sumter to allocate funding for safety treatments within budget and maximize the number of safety treatments addressed.

The most important aspect of this analysis is that the established safety problems are addressed. In addition, the priority rankings should be updated periodically to determine the effectiveness of the implemented countermeasures and to determine new locations that may need safety treatments.